

WATER-BEARING DOMESTIC APPLIANCE COMPRISING A DRAINAGE PUMP  
AND CORRESPONDING DRAINAGE PUMP

The invention relates to a water-bearing domestic appliance  
5 comprising a drainage pump which has a pump impeller used  
to convey liquid and to a drainage pump with a pump  
impeller.

In water-bearing domestic appliances such as dishwashers or  
10 washing machines a drainage pump is used to pump away dirty  
cleaning liquid. At the end of a drainage process air  
enters into the pump housing. This sucked-in air is  
concentrated at the centre of the rotating pump impeller as  
a result of the pressure conditions and results in a  
15 breakaway or reduced conveying flow. Any remaining  
quantities of liquid are thus not pumped away by the  
drainage pump or are pumped away with a delay. Every  
drainage pump shows this problem which results in operating  
disturbances or requires other expensive or disadvantageous  
20 measures.

A ventilation device for a drainage pump in dishwashers is  
known from the German Utility Model 94 06 463 U1, which has  
a ventilation opening on the suction side for air enclosed  
25 at the centre of the drainage pump to flow out. This  
ensures that functional disturbances on restarting the  
drainage pump are avoided.

It is the object of the invention to provide a water-  
30 bearing domestic appliance of the type described wherein  
the conveyance of air and liquid and the pumping capacity  
of the drainage pump are improved and further to provide a  
corresponding drainage pump.

35 The object is solved according to the invention for the  
water-bearing domestic appliance by the features of claim 1

and by the further independent claim for the drainage pump. Further developments of the invention are given in the dependent claims.

5 Starting from a water-bearing domestic appliance with a drainage pump which has a pump impeller and a drainage pump with a pump impeller, the draining pump according to the subject matter of the invention has a separate chamber which is located behind the pump impeller in relation to  
10 the direction of flow of liquid and is equipped with respective radial bores on its external diameter and in the vicinity of its internal diameter. As a result of the separate chamber, a liquid flow is advantageously formed from the external diameter to the internal diameter and  
15 then into the centre of the pump impeller whereby the air is better vortexed with the liquid and the mixture thus formed is more effectively pumped away. The pumping capacity and the suction behaviour of the drainage pump are improved, especially without external expenditure and  
20 without delaying of the conveying medium caused by ventilation openings or ventilation channels in the pump housing.

According to a favourable further development of the  
25 invention, the separate chamber is arranged as close as possible to the pump impeller. The liquid flow in the flow circuit of the drainage pump from the external diameter to the internal diameter of the separate chamber and from there to the centre of the pump impeller for mixing liquid  
30 with air can thus be further improved.

According to a further favourable embodiment of the invention, a plurality of bores are provided for the external diameter and the internal diameter. The bores for  
35 the external diameter and internal diameter are preferably provided so that they are each distributed uniformly on the

separate chamber. Both measures positively influence the liquid flow in relation to the flow circuit of the drainage pump.

5 A further embodiment of the invention whereby the bores have a small cross-section has proved to be of particular value.

The previously described features are advantageously also  
10 used in the drainage pump with an impeller according to the invention and especially in dishwashers and washing machines.

The invention provides a water-bearing domestic appliance  
15 with a drainage pump which has a pump impeller used to convey liquid, wherein the conveyance of air and liquid and the pump capacity of the drainage pump are improved and further provides a corresponding drainage pump with a pump impeller.

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The subject matter of the invention is explained in detail with reference to an exemplary embodiment shown in the figures. In detail the figures show:

25 Figure 1 a drainage pump of a water-bearing domestic appliance according to the invention and

Figure 2 shows a section of the chamber pertaining to the drainage pump with an exemplary arrangement of  
30 bores.

Figure 1 show a drainage pump 1 according to the invention of a water-bearing domestic appliance according to the invention, which is not shown in detail, typically a  
35 dishwasher or a washing machine, which has a pump housing 2 with a pump impeller 3. An inlet connecting piece 4 via

which liquid, for example water, can be conveyed into the pump impeller 3 or air can be sucked in, runs in the direction of the axis of the pump impeller 3 and is moulded on the input side of the pump housing 2. A motor housing 5 with the drive motor for the pump impeller 3 for example with straight vanes which can be set in rotation is also located in the direction of the axis of the pump impeller 3 and is moulded on the other side of the pump housing 2. The drainage pump 1 also has an outlet connecting piece 10 which is arranged radially in relation to the axis of the pump impeller 3.

According to the subject matter of the invention, the water-bearing domestic appliance has a drainage pump 1 with a separate chamber 6 which is located behind the pump impeller 3 in relation to the direction of the conveyed liquid, i.e., the axis of the pump impeller 3, and is provided with respective radial bores 7' and 7" on its external diameter 11 and in the vicinity of its internal diameter 12. As a result of the separate chamber 6, a liquid flow, identifiable from the arrows in Figure 1, is advantageously produced from the external diameter 11 to the internal diameter 12 and then into the centre 9 of the pump impeller 3, whereby the air is better vortexed with the liquid and the mixture 8 thus produced is pumped away more effectively. The pump capacity and the suction behaviour of the drainage pump 1 are improved, especially without external expenditure and without any delay of the conveying medium caused by ventilation openings or ventilation channels in the pump housing 2.

In a favourable fashion the separate chamber 6 is arranged as close as possible to the pump impeller 3 whereby the liquid flow in the flow circuit - see arrows - of the drainage pump 1 from the external diameter 11 to the internal diameter 12 of the separate chamber 6 and from there to the centre 9 of the pump impeller 3 for mixing

liquid with air can thus be further improved. A plurality of bores 7', 7" are provided for the external diameter 11 and the internal diameter 12 and preferably provided so that they are each distributed uniformly on the separate  
5 chamber 6. Both measures positively influence the liquid flow - see arrows - in relation to the flow circuit of the drainage pump 1.

For illustration Figure 2 shows a section of the separate  
10 chamber 6 pertaining to the drainage pump with an exemplary arrangement of bores. Thus, one bore 7' is located on the external diameter 11 of the chamber 6 whereas another bore 7" is located near the internal diameter 12 of the chamber 6. In total, the chamber 6 has respectively four uniformly  
15 distributed radial bores 7' and 7" both on its external diameter 11 and also on its internal diameter 12. The arrows show the behaviour of the liquid flow from the external diameter 11 with bore 7' where a higher pressure prevails to the internal diameter 12 with bore 7" where a  
20 lower pressure prevails and from there to the centre of the pump impeller. It has proved to be of particular value if the bores have a small cross-section so that all the bores have a diameter of 3.5 mm each for example.

25 The invention provides a water-bearing domestic appliance with a drainage pump 1 which has an impeller wheel 3 used to convey liquid, wherein the conveyance of air and liquid and the pump capacity of the drainage pump 1 are improved and further provides a corresponding drainage pump 1 with a  
30 pump impeller 3.